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(54) **HAND-HELD DEVICE WITH TOUCHSCREEN
AND DIGITAL TACTILE PIXELS**

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(57) **ABSTRACT**

A hand-held electronic device is disclosed. The device may comprise a case having one or more major surfaces; a touch screen disposed on one of the major surfaces, the touch screen; a processor operably coupled to the touch screen; and one or more tactile pixels disposed proximate the touch screen. Each of the tactile pixels includes an actuatable portion coupled to an actuator and a sensor. The actuator and sensor are coupled to the processor. The actuator is configured to actuate in response to instructions from the processor and the sensor is configured to generate signals as inputs to one or more programs executed by the processor when pressure is applied to the actuatable portion. The actuatable portion is actuatable by the actuator between first and second positions. A tactile feel of the actuatable portion is different in the first and second positions.

